



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

JUDGING A TEACHER OF MATHEMATICS.

By WILLIAM E. BRECKENRIDGE.

To the supervisor of mathematics who desires to see more in a recitation and to save time in characterizing his teachers' work, the following discussion may have some suggestions. To the young teacher of mathematics who is ambitious to make the greatest possible success, a knowledge of points on which he is to be judged may help to improve his teaching. Recently there has been great activity in making out lists of points on which a teacher should be judged. In New York City, especially, the requirement that a teacher shall be judged to be of superior merit at certain times in his career before he is advanced in salary grade, has made it necessary to define the term "a teacher of superior merit." Some of our best judgments are hardest to analyze. The late Supt. Stevens, in charge of high schools in New York City, said: "I think I know a good teacher when I visit his recitation but I cannot define him."

Undoubtedly the most important part of a teacher's work, his influence on his students, cannot be reduced to a definition. Granting this, there are, however, certain well-defined points on which a teacher may be judged.

Any plan of criticism should include strong as well as weak points. One of our best high school principals owes his popularity with his teachers to his custom of never criticizing a teacher adversely without mingling some praise with the criticism. It may be said that this is also a good plan in dealing with pupils.

The activities of a teacher are exercised in two large general fields; (A) IN THE CLASSROOM and (B) OUTSIDE OF THE CLASSROOM. The greater part of this discussion is concerned with the former. (A) *For what should a supervisor be on the alert during his visit to a classroom?*

There must be some overlapping in any classification of a

teacher's qualities, but for convenience, let us use two main heads, (I) DISCIPLINE, (II) INSTRUCTION.

(I) In judging a teacher's discipline, the supervisor should observe first of all *how a class enters the room*. Is it quiet or noisy? Experienced teachers know that students may pass from a room where they have been noisy and disorderly to a room across the hall where they will be in perfect order, because they feel that they are in a different atmosphere. Do the pupils feel when inside the door that they are on ground where it is not safe to trifle or do they feel that they are on ground which is appropriate for successful trench warfare against the teacher and begin to lay in a supply of ammunition in the shape of chalk and board erasers?

As to *whispering* or talking in the class, circumstances may make it possible for a teacher to allow a natural whispered question occasionally without disaster to the class, but usually in our large classes it is safer to allow no whispering. An annoying habit in some classes is *answering before being called by name*. This is usually due to the careless and indefinite manner in which the teacher asks questions. Care in directing every question to a particular pupil will usually remedy this defect. An effective device is calling from cards held in the hand or from a map of the room, the order of course being (1) question, (2) slight pause, (3) calling the pupil by name.

Concert answers are allowed by teachers of some subjects but they cannot be defended in a mathematical recitation.

A general *tendency to mischief or disorder* sometimes present in a class is often difficult to detect. The presence of the supervisor will usually guarantee good order while he is in the room. This particular tendency of a class can better be detected by a number of brief glances into the room.

The *attitude of the class* toward the teacher is very important. Five degrees may be distinguished:

1. The *sullen* class is "fighting mad." The teacher is holding the lid on, but by great effort. This attitude is almost always the result of injustice in the teacher's treatment of his pupils.

2. The *indifferent* class has no feeling about the teacher one way or the other, but is glad when the recitation is over.

3. In the *respectful* class, the pupils show by their acts that they hold the teacher in high esteem.

4. Between the *cordial* class and the teacher there exists real friendship, and warm mutual regard. The class welcomes and enjoys the recitation hour.

5. The *enthusiastic* class shows a love for the subject. The great truths of mathematics have taken firm root. It is sometimes difficult to keep these pupils in order because they all wish to participate in the recitation.

This subject of discipline deserves more extensive treatment than is possible within the limits of this paper. One suggestion, however, may not be amiss. In the case of an obstreperous class, it is often a decided help to the teacher for the supervisor to suggest a change in the form of the recitation. A good form for this case is where the teacher assigns a problem and the students solve it at their seats, the first one finishing going to the board and explaining. No discussion is allowed until the student at the board has finished his explanation and then only as much as the teacher thinks wise. Meanwhile the teacher is free to move about the room wherever he may be needed. The emphasis is on leading the pupil to do things rather than on restraining him from activity. New teachers finding trouble with discipline and acting on the advice of the supervisor have used this form of recitation exclusively for a week with good results in teaching and a great improvement in discipline. Of course any one form of recitation should not be continued indefinitely.

Under the head of (II) INSTRUCTION, the supervisor should observe first of all how well a class is paying *attention*. For this purpose he should take a position in the front of the room where he can see the pupil's eyes.

There are *two common causes of inattention*. The first is the *dialogue method of teaching*. After a pupil is called up, there ensues a dialogue between him and the teacher. Other pupils know they are safe as long as the pupil reciting is on his feet and they take a vacation until this pupil sits down. Then there is a moment of strained attention of the whole class, the only purpose of which is to find out who is to be called next. This is a very common fault of young teachers, especially those who

have been doing considerable tutoring. Obviously the remedy is to ask questions in such a way as to command the attention of the entire class.

Another common cause of inattention is the *failure to hold pupils immediately responsible for the teaching i. e.*, too much impression and too little expression. If the students know they are to be held responsible for the reproduction of the teaching, they will usually pay attention.

A supervisor after visiting one of his teachers remarked: "One third of your class was not paying attention and in seeking the reason, I found that you were not holding your pupils immediately responsible for the principles taught." The teacher had thought that the recitation was a good one, but after attending to the suggestion of his supervisor, he was amazed and delighted to find a marked increase in efficiency.

Is the class *interested*? If the teacher can teach the pupil thoroughly something that he did not know before, there will be a feeling of growth in power which is the greatest factor in interest. If in addition, the subject can be presented so that it seems worth while, there will be an increased interest, particularly on the part of certain types of mind. The most interesting thing to a child is the discovery of some new power in himself.

When interest lags in mathematics it is often worth while for the teacher to furnish points of contact with experience in the form of real problems or mathematical recreations. A teacher in a suburban town, finding his class in geometry dull and lifeless, applied to a supervisor for advice. The supervisor, finding that, apparently, original work had been used quite enough, suggested to the teacher that he start a discussion on the trisection of the angle, showing at the same time how to make a machine that would draw the Conchoid of Nicomedes by the aid of which any angle may be trisected. Within a week the teacher reported as follows: "The whole town is trying to trisect the angle and there is no more dullness in the mathematics class."

Again the supervisor will observe whether the class is *industrious*. Is the whole class busy all of the time? Of course it is not. But how closely does the teacher approximate to the

desired result? In this same connection, do the *pupils work rapidly or do they dawdle?* Dawdling is said to be the great fault of the American schools. A wholesome respect for time should be inculcated in the pupils and without driving them so hard as to make them nervous, there should be a reasonable speed observable in the movement of the recitation. Where more speed seems desirable, devices for obtaining it are (1) oral work with rapid fire questioning, (2) a time limit after which no work is received, (3) rating the first problem done correctly at 10, the next 9, etc., (4) the method of drill described under the discussion of Discipline.

Did the teacher *repeat pupils' answers?* His idea is that he impresses the truth upon the pupil by repeating the answer. But if the answer requires repeating, it is better to call upon another student. In the great majority of cases it is a waste of time for the teacher to repeat a pupil's answer. The students become inattentive to the recitations of their fellows and listen only when the teacher talks. The student reciting should be taught to express himself well enough to be heard by everyone in the room.

Was the *result of the hour's work* a reasonable degree of love for the subject and new power on the part of the pupils?

Some supervisors use this as their only test. They say: "The proof of the pudding is in the eating. It does not matter how it is made."

A great many factors make up *personality*, but the supervisor will ask at least the following questions:

Is the teacher sufficiently *forceful?* Force does not mean loud talking. It does mean that the teacher must have energy enough so that his teaching will carry to every student in the room.

Is the teacher *poised or nervous?*

Is he *alert?* The writer knows a teacher who has an eye like an eagle and who sees things in his class long before they occur. In other words the teacher notes instantly the slightest inattention and is ready with the remedy before the fault would be noticed by a visitor to the class. It is the business of every instructor to watch his class and know just what everyone is doing at every moment. A young teacher especially needs to be cautioned on this point. He should not turn his back on his class until he is sure of control. If there is to be writing

on the blackboard, let a pupil do it. The teacher should take such a position that he can watch the class and teach at the same time.

Is the teacher *enthusiastic*? Enthusiasm may be natural, cultivated, or assumed, but it is vital to the best teaching. To him who is inspired with the message of the great truths of mathematics and who is in sympathy with the life of boys and girls enthusiasm should be natural and contagious. One of the best teachers that the writer has ever known was compelled to assume the enthusiasm which she knew was essential to success. When complimented on a recitation and especially on her great enthusiasm for the subject, she replied "Do you know I hate the whole thing?" Although this is an extreme instance, the success of the teacher in cultivating and assuming enthusiasm may be comforting to some of us in a similar position.

Is the teacher *sympathetic* toward the weak but earnest students? Some of the oldest members of our profession are lacking in the respect. They have lost their sympathy for boys and girls and their appreciation of the difficulties that beset the mind of the weak pupil in his mathematics lesson. A real missionary spirit is desirable for this kind of work.

On the other hand, is the teacher *quick to detect and adequately deal* with the lazy or dishonest student? It is rare that the same teacher is good in this respect and at the same time is sympathetic.

Does the teacher *win cooperation*, or does he antagonize his students?

Neatness in dress deserves only this comment: It is one thing that a supervisor can write down in cold black and white as a fact. An examiner of teachers recently said "It is bad enough to say to a man that he is lacking in neatness, but to say this to a woman is about as much as my life is worth."

Again, the supervisor will ask "Is the teacher *dignified in bearing* and position in the classroom?" A teacher during his second year out of college was giving a lesson to a class of boys in the presence of a visiting superintendent whose school the teacher desired to enter. During the entire recitation, the teacher was tipped back in his chair with his feet on the desk. At the close of the hour, the superintendent complimented him on a fine recitation, but added: "If you come with us, you will

have to get your feet down from the desk. We have girls in our school." Now it had never before occurred to the teacher accustomed to the easy, lounging attitudes of college life that there was anything undesirable in his attitude. This matter of dignity in position and bearing is therefore commended especially to young teachers. Is the *voice* clear, distinct, pleasing, and well modulated? The late Rev. T. T. Munger, of New Haven, when asked how he would tell whether a man would make a good public speaker, replied: "I would judge him as I would judge a horse—look in his mouth." Certainly a prospective teacher should be sure that he has a good voice or he will be most seriously handicapped.

In the *use of English* are any defects apparent?

Is the teacher *courteous* to the class? Because he has absolute authority is no reason why he should treat his pupils with sarcasm and ridicule. The writer has in mind a boy who begged with tears running down his cheeks to be transferred out of the class of a teacher who, the boy said, "made a fool of me before the class."

Has the teacher *self control*? The days when the supervisor came into the room and intentionally stumbled into the waste basket in order to test the self control of both teacher and pupils are happily gone. There are plenty of situations developing naturally that sufficiently test self control.

Has he *good health*? By one of our foremost educators this matter of health is placed first of all qualities that make up the equipment of a teacher.

Is he *resourceful or dependent*? Is it true of him as one boy said: "My teacher has the advantage of me in geometry, because he has the book open?" In power of illustration, is the teacher able to draw from a large stock of material?

These are the principal points under personality.

Largely dependent upon personality, is a teacher's *skill in teaching*. Under this head a supervisor would ask:

Is there *motivation*? Did the teacher make the subject seem worth while to the student? Few take time at the beginning of the recitation to show the motive of the work. Where there is strong motivation, there is a great increase in interest and efficiency. There is no part of algebra or geometry where the

teaching may not be strengthened by a few minutes devoted to this important part of instruction.

Is the teaching *scholarly*? At the close of the teaching has the theory of the topic been exhausted? Scholarly teaching does not necessarily mean bringing in higher mathematics, but it does involve a wider view of the subject than can be gained from a single text book.

Is the arrangement of the lesson *logical*? Much time is often lost by poor arrangement.

Is the teacher clever in *questioning*?

In this connection, the writer strongly recommends the article on Questioning by Prof. Stevens, which may be obtained from The Bureau of Publications of Teachers College. Under this subject the supervisor will note how many natural questions were asked by the class, *i. e.*—questions relevant to the subject asked because the pupils desired information. Of the questions asked by the teacher, how many stimulated thought in the pupils? How many were questions of fact? Were the questions well distributed about the class? Too often the teacher is tempted to call only upon those whose hands are raised.

A good teacher will watch for the inattentive student and call upon him in order to command his attention. The weak students will not be neglected, but will receive the greater portion of the time of the recitation. In this connection, the writer is tempted to repeat a story told at a recent meeting of mathematics teachers by Mr. Albert H. Wheeler. A superintendent, who was visiting a teacher's class, observed that he liked to see pupils raise their hands. It showed, he said, that they were interested in the subject. After the departure of the superintendent the teacher instructed his class as follows: "If you know the answer to my question, raise your right hand, if you do not know it, raise your left." When the Superintendent called again, the result can be imagined.

Again, is there evidence that the *work is planned*?

Every teacher should have a plan for the term and a detailed plan for every recitation carefully prepared in advance. Always it is well to plan the work. Generally it is well to work the plan, the only exception being in case the prepared lesson does not seem adequate for the occasion.

Is there a correct ratio between the teaching and drill?

Does the teacher have any method of finding out whether every pupil has studied his lesson adequately?

If so, *does he follow up delinquents?* These two points are very important, for upon them depend the development of industry in the pupils. A teacher should find out before a pupil has left the room whether he has adequately prepared his lesson. One good way to accomplish this is to give a brief test, say of five minutes, at the beginning of every recitation. In geometry the test question must be given from the advance lesson. If the proposition is too long for five minutes, require only an outline proof which means the steps in order without the reasons. By assigning a captain to every row these tests can be corrected and marked roughly c=correct or nearly so, h=half correct, w=all wrong. While the recitation is going on, these tests may be corrected and the results entered in the teacher's record book by a pupil acting as secretary. Hence it is possible, even in geometry, within twenty minutes after the recitation begins, to find out who has studied his lesson adequately. There is a great advantage in getting hold of the boy who has neglected his lesson before he leaves your recitation.

But it will be futile to find out who is delinquent unless he is followed up. A school that does excellent work on examinations gives as the secret of its success the simple fact that if a boy fails in a lesson he stays after school till he makes it up and that this is carried on persistently day after day. Possibly some of us will not believe in carrying the nursing process to that extent, but it surely is productive of excellent results on examinations.

The *home work* should be inspected by the supervisor and judged as to quantity, quality, and form.

Did the teacher show *power to use devices for expediting class work?* For example if there was paper given out, was it done in an orderly and expeditious manner?

Were the pupils *taught how to study the next lesson?*

Were they required to maintain *good posture* both sitting and standing?

These are the important things in the application of the teacher's skill to his work and complete the points on which to judge a teacher within the classroom.

(To be concluded in the next issue.)